

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re Application of:

Brandon A. Grooters

Entitled: METHOD AND APPARATUS FOR AUTOMATICALLY GENERATING A  
DEVICE USER INTERFACE

January 27, 1999

To the Assistant Commissioner  
for Patents  
Box Patent Application  
Washington, D.C. 20231

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Paragita J. McAndrews

*Paragita J. McAndrews*  
Signature

Dear Sir:

## REQUEST FOR FILING A NATIONAL PATENT APPLICATION

Transmitted herewith for filing, please find the following:

- ☒ 1. Specification, claims and abstract of the above-referenced patent application having 17 pages.
- ☒ 2. Four (4) sheet(s) of drawing(s) (☒ formal / ☐ informal) comprising Figures 1 through 4.
- ☒ 3. Combined Declaration and Power of Attorney (☒ signed ☐ unsigned).
- ☐ 3A. No filing fee, Oath, or Declaration is enclosed pursuant to 37 C.F.R. 1.53(d).
- ☐ 4. Information Disclosure Statement along with Form PTO-1449 and references.
- ☐ 5. This is a: ☐ Continuation-In-Part; ☐ Divisional; ☐ Continuation; ☐ substitute Application (MPEP 201.09) of Application Serial No. ☐ filed ☐; ☐ reissue of U.S. Patent No. ☐ filed on ☐.

An extension to extend the life of the above prior Application to at least the date of filing hereof

(One box must be marked)

- (a) \_\_\_\_\_ is concurrently being filed in that prior Application,  
(b) \_\_\_\_\_ was previously filed in that prior Application,  
(c) \_\_\_\_\_ is not necessary for copendency.

X 6. Attached is an assignment to Gateway 2000, Inc. Please return the recorded assignment to the undersigned.

7. Priority is claimed under 35 U.S.C. § 119 based on filing in European Patent Office.

Application No.

Filing Date

(1) \_\_\_\_\_

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(2) \_\_\_\_\_

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(3)

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\_\_\_\_\_ (No.) Certified copy (copies) \_\_\_\_\_ are attached; or \_\_\_\_\_ were previously filed on \_\_\_\_\_.

8. Attached: \_\_\_\_\_ (No.) verified statement(s) establishing "small entity" status under 37 CFR § 1.9 and 1.27.

  X   9. Attached:

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(Other)

10. Preliminary Amendment:

Prior to a first Office Action, kindly amend the Application as follows:

11. The following Filing Fee calculation is based on the claims filed less any claims canceled by the Preliminary Amendment of Item 10.

BASIC FEE				SMALL ENTITY RATE		LARGE ENTITY RATE		
				\$380	OR	\$760	=	\$760.00
TOTAL CLAIMS				NUMBER FILED		NUMBER EXTRA		
				20	-20	=	0 (at least 0)	x 9
								OR
								x 18
							=	+\$0
INDEP. CLAIMS				4	-3	=	1 (at least 0)	x 39
								OR
								x 78
							=	+\$78.00
If any <u>proper</u> multiple dependent claim (ignore improper) is present (Enter \$0.00 if this is a <u>response</u> application.)								+
								\$130
								OR
								+\$260
							=	+\$0
If assignment is x'd (item 6), add recording fee \$40.00								+
								\$40.00
Attached is a Rule 47 Petition (inventor refuses to sign or cannot be reached) \$130								+
								\$0
TOTAL FILING FEE								=
								\$878.00

12. A check in the amount of \$\_\_\_\_\_ to cover the Filing Fee calculated in Item 11 is attached. Please charge any deficiency or credit any overpayment to Deposit Account No. 50-0439.
13. Please charge my Deposit Account No. 50-0439 in the amount of \$878.00 to cover the Filing Fee calculated in Item 11. This sheet is attached in duplicate.
- X 14. The Commissioner is hereby authorized to charge any fee specifically authorized hereafter, or any missing or insufficient fee(s) filed, or asserted to be filed, or which should have been filed herewith or concerning any paper filed hereafter, and may be required under 37 CFR 1.16-1.18 (missing or insufficiencies only) now or hereafter relative to this application and for the resulting Official Document under 37 CFR 1.20, and to have and cause any necessary petition for extension of time to be filed and any fees necessary to be paid for said extension of time OR credit any overpayment to our Deposit Account No. 50-0439, for which purpose a duplicate copy of this sheet is attached. **The Commissioner is not authorized to charge the issue fee until/unless an issue fee transmittal form is filed.**

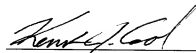
Docket No.: 98-0674

Patent Application

DATED: January 27, 1999.

Respectfully submitted,  
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR PATENT

ON

METHOD AND APPARATUS FOR AUTOMATICALLY GENERATING A  
DEVICE USER INTERFACE

BY

BRANDON A. GROOTERS

# METHOD AND APPARATUS FOR GENERATING A DEVICE USER INTERFACE

## FIELD OF THE INVENTION

The present invention generally relates to the field of information handling systems, and particularly to a user interface for an information handling system.

## BACKGROUND OF THE INVENTION

Information handling systems are increasingly utilized as a central control unit for multimedia devices. Typical multimedia devices include media players such as audio amplifiers, receivers, videocassette recorders (VCRs), compact disc (CD) players, digital versatile disc (DVD) players, audio equalizers, audio and video processing systems, etc. Since multimedia devices are manufactured by a variety of manufacturers, many features offered by the manufacturer of one type of media device are not included with the same type of device from a different manufacturer. Further, the same manufacturer of multiple models of the same type of media device does not always provide the same features and functions for all of those devices. Therefore, only a common denominator of functions exists in each of a single type of media device. For example, the common denominator for VCR devices includes the "play", "stop", "pause", "fast forward" and "rewind" functions. Other functions may or may not exist on any particular media device.

Existing user interfaces for managing multimedia devices with an information handling system are forced into only providing the common denominator functions for a given category of devices. As a result, these user interfaces cannot exploit the rich variety of features and functions included with many of the latest models of media devices, thereby limiting the usefulness of managing the multimedia devices with an information handling system. Thus, there lies a need for a user interface which is capable of providing control of all, or nearly all, of the available functions of multimedia devices beyond the common denominator functions of the category of media devices.

## SUMMARY OF THE INVENTION

The present invention is directed to a system for generating a device user interface executable by an information handling system. In one embodiment, the system includes a processor for executing instructions on the information handling  
5 system and a memory coupled to the processor for storing instructions executed by the processor, a device database including a list of devices for which user interface components are available to implement functions for controlling the devices, a resource database including the user interface components, a user interface generator for determining whether the device is included in the device database and for  
10 retrieving the user interface components from the resource database, and a layout manager for assembling the user interface components retrieved by the user interface generator into a user interface executable by the information handling system to control the device.

The present invention is further directed to a method for generating a device  
15 user interface executable by an information handling system. In one embodiment, the method includes steps for identifying the device coupled to the information handling system to be controlled by the user interface, comparing the identified device to a database of devices for which user interface resource components are available for implementing the functions of the device and determining whether the device is listed  
20 in the database, in the event the device is not listed in the database, retrieving generic device user interface components for devices of the type of the identified device, otherwise, retrieving user interface components for implementing specific functions of the device, assembling the user interface components into a layout matrix, and creating the user interface from the layout matrix of the assembled user interface  
25 components

It is to be understood that both the forgoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention as claimed. The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate an embodiment of  
30 the invention and together with the general description, serve to explain the principles of the invention.

### BRIEF DESCRIPTION OF THE DRAWING

The numerous advantages of the present invention may be better understood by those skilled in the art by reference to the accompanying figures in which:

FIG. 1 is a block diagram of an information handling system operable to  
5 embody the present invention;

FIG. 2 is a block diagram of a system for automatically generating a user interface for a device of an information handling system in accordance with the present invention;

FIG. 3 is a flow diagram of a method for generating a device user interface in  
10 accordance with the present invention; and

FIG. 4 is a block diagram of the assembly of a user interface from device function objects in accordance with the present invention.

### DETAILED DESCRIPTION OF THE INVENTION

15 Reference will now be made in detail to the presently preferred embodiment of the invention, an example of which is illustrated in the accompanying drawings.

Referring now to FIG. 1, a hardware system of an information handling system in accordance with the present invention is shown. The hardware system shown in FIG. 1 is generally representative of the hardware architecture of an  
20 information handling system of the present invention. A central processing system 102 controls the information handling system 100. Central processing system 102 includes a central processing unit such as a microprocessor or microcontroller for executing programs, performing data manipulations and controlling the tasks of information handling system 100. Communication with central processor 102 is  
25 implemented through a system bus 110 for transferring information among the components of information handling system 100. Bus 110 may include a data channel for facilitating information transfer between storage and other peripheral components of information handling system 100. Bus 110 further provides the set of signals required for communication with central processing system 102 including a data bus,  
30 address bus, and control bus. Bus 110 may comprise any state of the art bus architecture according to promulgated standards, for example industry standard architecture (ISA), extended industry standard architecture (EISA), Micro Channel



Architecture (MCA), peripheral component interconnect (PCI) local bus, standards promulgated by the Institute of Electrical and Electronics Engineers (IEEE) including IEEE 488 general-purpose interface bus (GPIB), IEEE 696/S-100, and so on.

- Other components of information handling system 100 include main memory 104, auxiliary memory 106, and an auxiliary processing system 108 as required. Main memory 104 provides storage of instructions and data for programs executing on central processing system 102. Main memory 104 is typically semiconductor based memory such as dynamic random access memory (DRAM) and or static random access memory (SRAM). Auxiliary memory 106 provides storage of instructions and data that are loaded into the main memory 104 before execution. Auxiliary memory 106 may include semiconductor based memory such as read-only memory (ROM), programmable read-only memory (PROM) erasable programmable read-only memory (EPROM), electrically erasable read-only memory (EEPROM), or flash memory (block oriented memory similar to EEPROM). Auxiliary memory 106 may also include a variety of non-semiconductor based memories, including but not limited to magnetic tape, drum, floppy disk, hard disk, optical, laser disk, compact disc read-only memory (CD-ROM), digital versatile disk read-only memory (DVD-ROM), digital versatile disk random-access memory (DVD-RAM), etc. Other varieties of memory devices are contemplated as well. Information handling system 100 may optionally include an auxiliary processing system 108 which may be a digital signal processor (a special-purpose microprocessor having an architecture suitable for fast execution of signal processing algorithms), a back-end processor (a slave processor subordinate to the main processing system), an additional microprocessor or controller for dual or multiple processor systems, or a coprocessor.
- Information handling system 100 further includes a display system 112 for connecting to a display device 114, and an input/output (I/O) system 116 for connecting to one or more I/O devices 118, 120 up to  $N$  number of I/O devices 122. Display system 112 may comprise a video display adapter having all of the components for driving the display device, including video random access memory (VRAM), buffer, and graphics engine as desired. Display device 114 may comprise a cathode ray-tube (CRT) type display such as a monitor or television, or may comprise alternative type of display technologies such as a liquid-crystal display (LCD), a light-

emitting diode (LED) display, or a gas or plasma display. Input/output system 116 may comprise one or more controllers or adapters for providing interface functions between one or more of I/O devices 118-122. For example, input/output system 116 may comprise a serial port, parallel port, infrared port, network adapter, printer adapter, radio-frequency (RF) communications adapter, universal asynchronous receiver-transmitter (UART) port, etc., for interfacing between corresponding I/O devices such as a mouse, joystick, trackball, trackpad, trackstick, infrared transducers, printer, modem, RF modem, bar code reader, charge-coupled device (CCD) reader, scanner, compact disc (CD), compact disc read-only memory (CD-ROM), digital versatile disc (DVD), video capture device, touch screen, stylus, electroacoustic transducer, microphone, speaker, etc. Input/output system 116 and I/O devices 118-122 may provide or receive analog or digital signals for communication between information handling system 100 of the present invention and external devices, networks, or information sources. Input/output system 116 and I/O devices 118-122 preferably implement industry promulgated architecture standards, including Recommended Standard 232 (RS-232) promulgated by the Electrical Industries Association, Infrared Data Association (IrDA) standards, Ethernet IEEE 802 standards (e.g., IEEE 802.3 for broadband and baseband networks, IEEE 802.3z for Gigabit Ethernet, IEEE 802.4 for token passing bus networks, IEEE 802.5 for token ring networks, IEEE 802.6 for metropolitan area networks, 802.11 for wireless networks, and so on), Fibre Channel, digital subscriber line (DSL), asymmetric digital subscriber line (ASDL), frame relay, asynchronous transfer mode (ATM), integrated digital services network (ISDN), personal communications services (PCS), transmission control protocol/Internet protocol (TCP/IP), serial line Internet protocol/point to point protocol (SLIP/PPP), and so on. It should be appreciated that modification or reconfiguration of information handling system 100 of FIG. 1 by one having ordinary skill in the art would not depart from the scope or the spirit of the present invention.

Referring now to FIG. 2, a system for automatically generating a user interface for a device of an information handling system in accordance with the present invention will be discussed. The system 200 represents the preferred embodiment in which an application 210 running on information handling system 210 is used to

control a device connected to information handling system 100. The device may be an input device, output device, or an input/output (I/O) device 122 coupled to information handling system 100. Typically, device 122 is a multimedia device coupled to information handling system 100 such that control of device 122 may be provided by the information handling system. For example, a user of information handling system may utilize a remote input device such as a wireless mouse or keyboard, represented for example as I/O device 118, to enter a control command into information handling system in order to operate device 122. Device 122 may be a DVD player coupled to information handling system 100. The user may enter a “play” command with the input device in order to initiate the playback of a DVD disc disposed in the DVD player. Application 210 receives the command and controls the DVD player to initiate playback of the DVD disc. The user is allowed to select from the group of commands or functions that are available to control device 122 by application 210 that provides a user interface 232 for displaying the group of commands and for executing a selected command. Application 210 may be initiated, for example, when a new device is coupled to information handling system 100 or when device 122 is powered on such that an appropriate user interface 232 may be generated by user interface generator 212. Alternatively, a user may cause the initiation of application 210 by causing the application to be executed by information handling system 100 (e.g., via an input command). Upon initiation, application 210 calls user interface generator 212 to generate an appropriate user interface 232 for controlling device 122. User interface generator 212 accesses a device database 214 that contains a list of known devices 216-220. Device database 214 contains a list of devices 216-220 for which control functions beyond the common denominator of functions of classes of devices are known. For example, device database 214 may be a registry stored in an information storage medium (e.g., auxiliary memory 106) of information handling system 100 containing a list of devices coupled to information handling system 100 and all of the functions that devices 216-220 are capable of providing. Device database 214 may be automatically generated by a program of instructions (e.g., an operating system) executing on information handling system 100 without requiring user intervention, or may be generated or modified by the user. A user interface (UI) resource database 222 contains a list of available functions 224-

228 that are known for devices 216-220 listed in device database 214 that are provided as modular user interface objects, including common denominator functions, for each of the functions provided by devices 216-220 stored in device database 214. One or more functions, both common denominator functions and unique functions, may be structured in the form of an object, a self contained data structure that includes data about the device and procedures or instructions for controlling or manipulating the device. Such objects are known in the art of object-oriented programming in which a data structure is defined by the type of data that it contains and by the types of operations that can be applied to the data structure. Objects are therefore modules that, once created, need not be changed or redefined when another object is created or defined. Object modules are thus easily combined into a larger program of instructions. Thus, a first object may provide data and instructions for common denominator functions for controlling a recording device (e.g., play, record). A second object may provide data and instructions for controlling a particular function for a recording device (e.g., video freeze frame). User interface generator 212 creates the objects as modular interfaces based upon device database 214 and stores the objects in UI resource database 222. User interface generator 212 may then retrieve the modular user interface objects from UI resource database 222 and combine the objects to form a complete user interface 232 for all, or nearly all, functions of devices 216 listed in device database.

For example, device 122 may be a particular make and model of videocassette recorder (VCR). Data about that particular make and model of the VCR may be stored in device database 214. Storage of a particular make and model of the VCR in device database 214 indicates that the control functions 224-228 of that particular make and model of VCR are stored in user interface resource database as user interface objects. The control functions include "play", "fast forward", "frame speed adjust", "stop", "rewind", "tape speed adjust", "pause", "frame advance", and "menus". A combination of user interface components is contained in UI resource database 222 from which a user interface may be created (see FIG. 4). For example, a first UI component may provide control of "play", "stop", "pause", "fast forward", "rewind", and "frame advance" functions. This first UI component provides the common denominator functions common to all VCR's in general. A second UI

component may provide control of "frame speed" functions. This function may be provided only for certain models of VCRs, but not all. Similarly, a third UI component may provide control of "tape speed adjustment" functions, and a fourth UI component may provide "menu" control functions for a particular make and model of VCR. User interface generator 212 retrieves the UI components from UI resource database 222 combining the functions 224-228 provided by the retrieved UI components to correspond to the available control functions for the device as listed in device database 214. The retrieved UI components are sent to a layout manager 230 that assembles the UI components into a user interface 232 (see FIG. 4). User interface 232 provides user control of the combination of functions for the selected device, for example, PLAY, STOP, PAUSE, FF, REW, and FA buttons to receive input commands from the user to execute the corresponding functions. Further, resulting user interface 232 may include a frame speed slider, a tape speed selector, and set up menu items to provide the additional functions available for the selected device. The user may then operate the device by entering the proper input commands using a coordinate position input device (e.g., mouse). When application 210 is used to control a different device, user interface generator 212 generates a new user interface customized for that particular, different device.

Application 210, user interface generator 212, layout manager 230 and user interface 232 may be embodied as a software program executed by central processing system 102 of information handling system 100. Device database 214 and user interface resource database 222 are preferably stored in main memory 104 or auxiliary memory 106 of information handling system. As necessary, device database 214 and UI resource database 222 may be maintained or updated via an information storage medium coupled to information handling system 100 (e.g., floppy disk, CD-ROM, ROM device) wherein the information storage medium contains updated device and UI resource information and routines for functions 228 of devices 220. Further, device database 214 and UI resource database 222 may be updated via information downloaded into information handling system 100 from a remote device coupled to information handling system 100 via a network (e.g., the Internet) coupled to input/output system 116.

Referring now to FIG. 3, a flow diagram of a method for generating a device user interface in accordance with the present invention will be discussed. The method 300 initiates when an application is run at step 310 for controlling a device coupled to information handling system 100. The type of device, and the make and model of the device are determined at step 312. For example, the device name may be entered by a user or provided by the device itself e.g., from a ROM chip disposed in the device having data of the device type that is readable by information handling system 100. After determination of the device, the device is compared at step 314 to device database 214 for which functions of the device are known and for which user interface components are available to implement those functions in a user interface. A determination is made at step 316 whether the determined device is listed in database 214 of known devices. In the event the device is not listed in device database 214, a determination is made at step 318 whether the determined device is similar to a device listed in device database 214. For example, information handling system 100 may test the device to determine the type of functions that the device is capable of executing, or the user may enter what the device is generically (e.g., "VCR"). If a test for a VCR recording function is sent to the device and the device returns a signal indicating that the device is recording, then a determination may be made that the device is a VCR. Further, application 210 may determine, or the user may select, the closest device match in database by matching the device to the closest device already existing in database 214. In the event the device is not similar to a device listed in device database 214, generic device user interface components are retrieved at step 320 from user interface resource database 222. The retrieved generic device UI components provide those functions that are common to all devices of the determined type of device. Otherwise, the device specific UI components for implementing the functions of the determined device as listed in device database 214 are retrieved at step 322 from UI resource database 222. Layout manager 230 places the retrieved UI components into a layout matrix at step 324 and creates a user interface 232 at step 326 for implementing the functions available for the determined device. User interface 232 may be generated automatically without requiring any intervention by the user. Method 300 may be implemented as a program of instructions stored in

main memory 104 or auxiliary memory 106 and executed by central processing system 102 or auxiliary processing system 108.

Referring now to FIG. 4, a block diagram of the assembly of a user interface from device function objects in accordance with the present invention will be discussed. UI resource database 222 contains one or more objects that incorporate the functions 224-228 of devices 216-220. For example, a first object 410 may be defined for a first class of devices 416 such as all VCRs. Object 410 may contain data 422 for common denominator functions 422 as a common set of instructions for controlling the class of all VCRs. The common denominator functions 428 may include instructions for implementing play, stop, pause, record, fast forward, and rewind functions for all VCRs. A second object 412 may be defined for a second class of devices 418 such as VCRs compliant with a first standard. Such devices may provide freeze frame functions 424 that include instructions 430 for holding and releasing a video image. A third object 414 may be defined for a third class of devices 420 such as VCRs compliant with a second standard. Such devices may provide a reverse play function 428 that include instructions for causing a VCR of class 420 to reverse play a video signal. Layout manager 230 is called by user interface generator 212 for assembling a user interface 232 based upon available functions for a given device. The given device may be a VCR compliant with the first and second standards. User interface generator 212 passes objects 410, 412 and 414 to layout manager 230 that assembles a user interface for controlling the VCR based upon the VCR functions provided by objects 410, 412 and 414. For example, layout manager 230 may assemble user interface by assembling icons corresponding to the functions 428, 430 and 432 of objects 410, 412 and 414, respectively. As shown in FIG. 4, user interface 232 may include icons for implementing common denominator functions (play 436, stop 442, pause 448, record 438, fast forward 444, and rewind 450), for implementing freeze frame functions (freeze frame release 440, freeze frame hold 446) and for implementing a reverse play function (reverse play 452). When a user selects an icon of user interface 232, information handling system 100 executes the corresponding instruction and thereby controls the VCR by calling the object having the corresponding instruction.

Although the invention has been described with a certain degree of particularity, it should be recognized that elements thereof may be altered by persons skilled in the art without departing from the spirit and scope of the invention. One of the embodiments of the invention can be implemented as sets of instructions resident

5 in the main memory 104 of one or more computer systems configured generally as described in FIG. 1. Until required by the computer system, the set of instructions may be stored in another computer readable memory such as auxiliary memory 106 of FIG. 1, for example in a hard disk drive or in a removable memory such as an optical

10 disk for utilization in a CD-ROM drive, a floppy disk for utilization in a floppy disk drive, a floptical disk for utilization in a floptical drive, or a personal computer memory card for utilization in a personal computer card slot. Further, the set of instructions can be stored in the memory of another computer and transmitted over a local area network or a wide area network, such as the Internet, when desired by the user. Additionally, the instructions may be transmitted over a network in the form of

15 an applet (a program executed from within another application) or a servlet (an applet executed by a server) that is interpreted or compiled after transmission to the computer system rather than prior to transmission. One skilled in the art would appreciate that the physical storage of the sets of instructions or applets physically changes the medium upon which it is stored electrically, magnetically, chemically,

20 physically, optically or holographically so that the medium carries computer readable information.

It is believed that the method and apparatus for automatically generating a device user interface of the present invention and many of its attendant advantages will be understood by the forgoing description, and it will be apparent that various

25 changes may be made in the form, construction and arrangement of the components thereof without departing from the scope and spirit of the invention or without sacrificing all of its material advantages, the form herein before described being merely an explanatory embodiment thereof. It is the intention of the following claims to encompass and include such changes.

30



## CLAIMS

What is claimed is:

- 1           1.     A system for generating a device user interface executable by an  
2     information handling system, comprising:  
3           a processor for executing instructions on the information handling system and  
4     a memory coupled to said processor for storing instructions for execution by said  
5     processor;  
6           a device database including listing available user interface components for  
7     implementing control functions of a device coupled to the information handling  
8     system;  
9           a resource database including the user interface components;  
10          a user interface generator for determining whether the device is included in  
11     said device database and for retrieving the user interface components for that device  
12     from said resource database; and  
13          a layout manager for assembling the user interface components retrieved by  
14     said user interface generator into a user interface executable by the information  
15     handling system to control the device.
- 1           2.     A system as claimed in claim 1, wherein the device is a multimedia  
2     device controlled by the information handling system.
- 1           3.     A system as claimed in claim 1, wherein said device database is  
2     created without requiring user intervention.
- 1           4.     A system as claimed in claim 1, wherein said resource database is  
2     created without requiring user intervention.
- 1           5.     A system as claimed in claim 1, wherein the user interface components  
2     of said resource database comprise discrete objects.

1           6.     A system for generating a device user interface executable by an  
2     information handling system, comprising:  
3           means for executing instructions on the information handling system and  
4     means, coupled to said executing means, for storing instructions for execution by said  
5     processor;  
6           means for listing available means for implementing control functions of a  
7     device coupled to the information handling system;  
8           means for storing the implementing means;  
9           means for determining whether the device is included in said device list  
10    storing means, and for retrieving the implementing means from said implementing  
11    means storage means; and  
12           means for assembling the implementing means retrieved by said determining  
13    and generating means into a user interface executable by the information handling  
14    system to control the device.

1           7.     A system as claimed in claim 6, wherein the device is a multimedia  
2     device controlled by the information handling system.

1           8.     A system as claimed in claim 6, wherein said device list storing means  
2     is created without requiring user intervention.

1           9.     A system as claimed in claim 6, wherein said implementing means  
2     storing means is created without requiring user intervention.

1           10.    A system as claimed in claim 6, wherein the implementing means  
2     comprises a discrete object variable.

1 11. A computer implemented method for generating a device user interface  
2 for an information handling system, comprising:  
3 identifying a device coupled to the information handling system to be  
4 controlled by the user interface;  
5 comparing the identified device to a database of devices for which user  
6 interface resource components are available for implementing the functions of the  
7 device and determining whether the device is listed in the database;  
8 retrieving user interface components for implementing functions of the device;  
9 and  
10 creating the user interface from the user interface components.

1 12. A method as claimed in claim 11, further comprising the steps of, in  
2 the event the device is not listed in the database, determining whether a similar device  
3 similar to the device is listed in the database; in the event a similar device is not listed  
4 in the database, executing said generic device user interface components retrieving  
5 step; otherwise, executing said device specific user interface components retrieving  
6 step.

1 13. A method as claimed in claim 11, further comprising the step of  
2 displaying the user interface on a display coupled to the information handling system  
3 such that a user may control the device with the user interface.

1 14. A method as claimed in claim 11, said creating step being implemented  
2 without requiring user intervention.

1 15. A method as claimed in claim 11, the user interface components  
2 comprising discrete objects.



# METHOD AND APPARATUS FOR AUTOMATICALLY GENERATING A DEVICE USER INTERFACE

5

## ABSTRACT

10 A system and a method generate a device user interface executable by an  
information handling system. A device database includes a list of devices for which  
user interface components are available to implement functions for controlling the  
devices, and a resource database includes the user interface components. The device  
15 to be controlled by the user interface is identified and compared to a database of  
devices for which user interface resource components are available. A user interface  
generator determines whether the device is included in the device database and  
retrieves the user interface components from the resource database. A layout manager  
assembles the user interface components into a user interface. If the device is not  
20 listed, generic device user interface components are retrieved, otherwise device  
specific user interface components are retrieved, and assembled into a layout matrix.  
The user interface is created from the layout matrix.

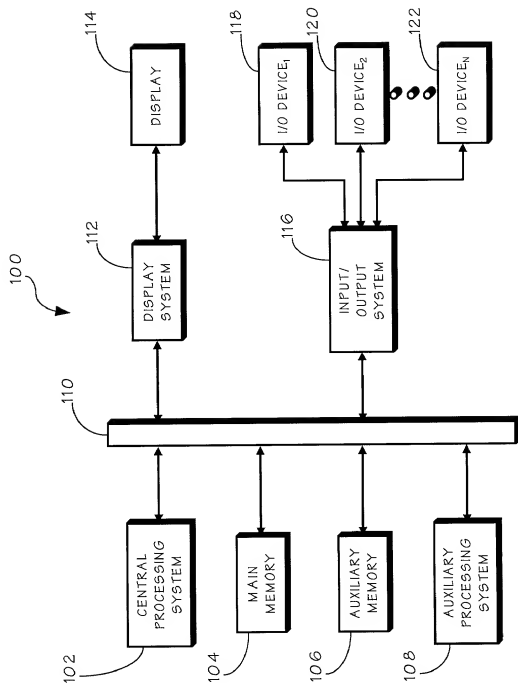


FIG. 1

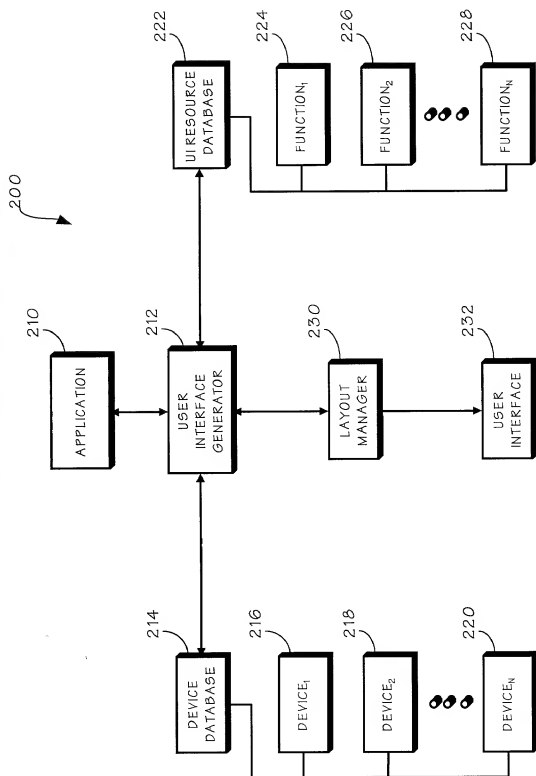


FIG. 2

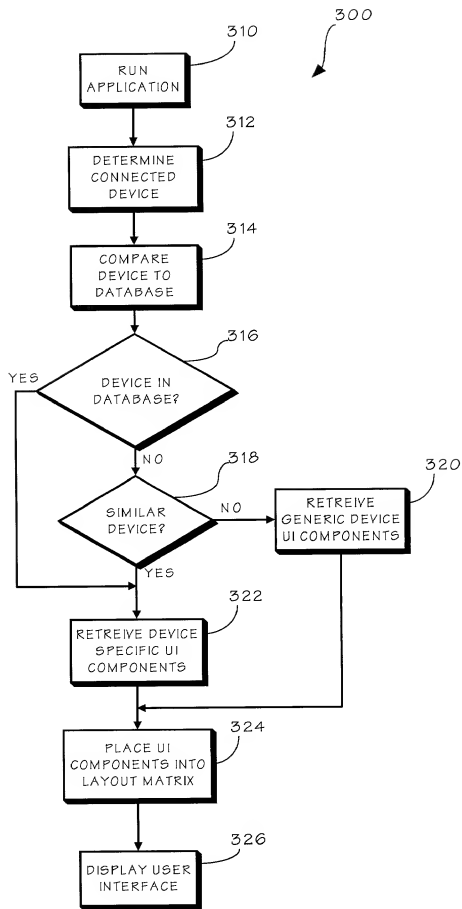


FIG. 3



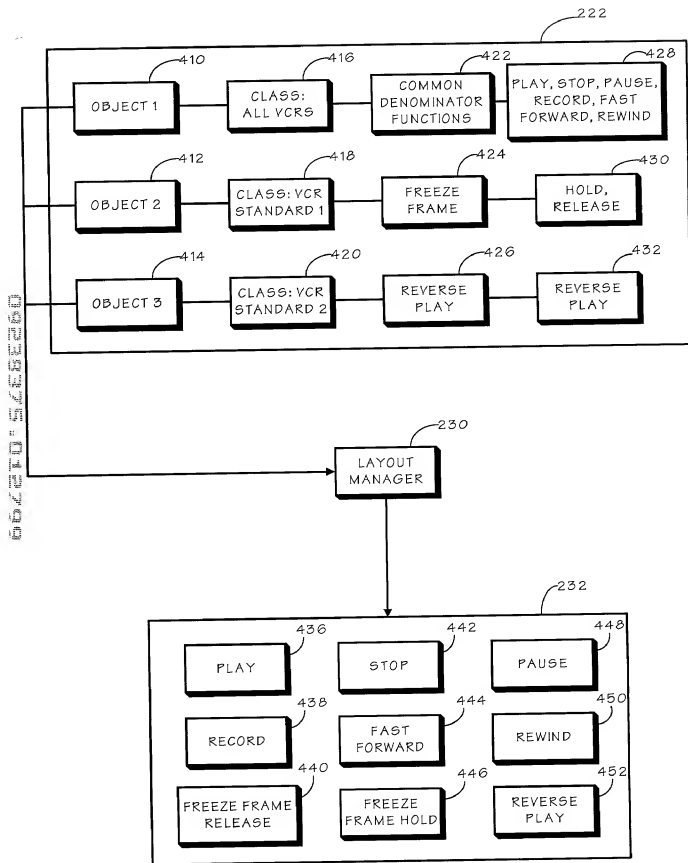


FIG. 4

**RULES 63 AND 67 (37 C.F.R. 1.63 and 1.67)**  
**DECLARATION AND POWER OF ATTORNEY**

**FOR UTILITY/DESIGN/CIP/PCT NATIONAL APPLICATIONS**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;  
and

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **METHOD AND APPARATUS OR AUTOMATICALLY GENERATING A DEVICE USER INTERFACE**, the specification of which:

- X   (a) is attached hereto.  
      (b) was filed on \_\_\_\_\_ as Application Serial No. \_\_\_\_\_ and  
was amended on \_\_\_\_\_ (if applicable)  
      (c) was filed as PCT International Application No. PCT/ \_\_\_\_\_ on \_\_\_\_\_ and  
was amended on \_\_\_\_\_ (if applicable).  
      (d) was filed on \_\_\_\_\_ as Application Serial No. \_\_\_\_\_ and was issued a  
Notice of Allowance on \_\_\_\_\_.  
      (e) was filed on \_\_\_\_\_ and bearing attorney docket number \_\_\_\_\_.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above or as allowed as indicated above.

I acknowledge the duty to disclose all information known to me to be material to the patentability of this application as defined in 37 CFR § 1.56. If this is a continuation-in-part (CIP) application, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to patentability of the application as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this CIP application.

I hereby claim foreign priority benefits under 35 U.S.C. § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application on which my priority is claimed or, (2) if no priority is claimed, before the filing date of this application:

PRIOR FOREIGN PATENTS

<u>Number</u>	<u>Country</u>	<u>Month/Day/Year Filed</u>	<u>Date first laid-open or Published</u>	<u>Date patented or Granted</u>	<u>Priority Claimed Yes No</u>
_____	_____	_____	_____	_____	_____

I hereby claim the benefit under 35 U.S.C. § 120/365 of any United States application(s) listed below and PCT international applications listed above or below:

PRIOR U.S. OR PCT APPLICATIONS

<u>Application No. (series code/serial no.)</u>	<u>Month/Day/Year Filed</u>	<u>Status(pending, abandoned, patented)</u>
_____	_____	_____
_____	_____	_____


I hereby appoint, Anthony B. Claiborne, Reg. No. 39,636, Mark S. Walker, Reg. No. 30699, Sean P. Suiter, Reg. No. 34,260, Scott C. Rand, Reg. No. 40,359, Kenneth J. Cool, Reg. No. 40,570, and Kevin E. West, Reg. No. P43,983 as my attorneys and/or agents, with full power of substitution and revocation, to prosecute this application, provisionals thereof, continuations, continuations-in-part, divisionals, appeals, reissues, substitutions, and extensions thereof and to transact all business in the United States Patent and Trademark Office connected therewith, to appoint any individuals under an associate power of attorney and to file and prosecute any international patent application filed thereon before any international authorities, and I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization who/which first sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct them in writing to the contrary.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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	<b>Residence</b> (city, state, country)		<b>Citizenship</b>
	<b>Post Office Address</b> (include zip code)		